

MICROLITHOGRAPHY REDUCTION OBJECTIVE AND PROJECTION EXPOSURE APPARATUS

Abstract

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A microlithography reduction objective formed from six mirrors arranged in a light path between an object plane and an image plane is provided. The microlithography reduction objective is characterized by having an image-side numerical aperture NA 0.15. In some embodiments, the mirror closest to the image plane, i.e., the fifth mirror is arranged such that an image-side optical free working distance is greater than or equal to a used diameter of a physical mirror surface of the fifth mirror, a physical mirror surface being the area of a mirror where light rays from the object impinge. The fifth mirror may be arranged such that an image-side optical free working distance is greater than or equal to the sum of one-third the used diameter of the physical mirror surface on the fifth mirror and a length between 20 mm and 30 mm. The fifth mirror may be arranged such that the image-side optical free working distance is at least 50 mm, as well. The image-side free working distance is the physical distance between the vertex of the surface of the fifth mirror and the image plane. Other embodiments are described.

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